RBI~ Technical Services

Project Management Consultancy Services

Quality Control Report
For the
Work of: Improvements to roads in Angala parameshwari temple road from Bhadrappa main road up to Shubham Apartments in ward no 8, Kodigehalli.

BBMP

#2243, 4th 'A' Cross, Hampinagar
Vijayanagar 2nd Stage, Bangalore-560104
Tel.: 080-23300857 Email: rbitc2@gmail.com

RBI - Technical Services

Reg. No. 290202107599 [MICRO/SERVICES]

Road - Building - Irrigation Material Testing Laboratory

NABL Accredited Laboratory as per ISO/IEC 17025-2005

Managing Director - P. Munikrishnappa, B.E., (Civil) M.I.E. K.E.S.

ISO 9001 - 2015 Certified

To,

Executive Engineer,
Byatarayanapura Division,
BBMP.

Sir,

Sub:-Submission of Quality Control Report, Regarding.

We are submitting here with the Quality Control Reports for the work of Improvements to roads in Angala parameshwari temple road from Bhadrappa main road up to Shubham Apartments in ward no 8, Kodigehalli.

Executed by the Agency, **Sri. G. N. Ramesh**

Yours sincerely,

RBI TECHNICAL SERVICES Sign..... Bangalore.

P.MUNIKRISHANAPPA,
B.E, MIE, KES, MIRC, MIIBE
Proprietor
RBI TECHNICAL SERVICES

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd State, Bengaluru - 560 104. Tel. : 080 - 23300857
Cell : 9448352709 Email : rbitc2@gmail.com

Quality Control Report For

Wet Mix Macadam

RBI - Technical Services

Reg. No. 290202107599 [MICRO/SERVICES]

Road - Building - Irrigation Material Testing Laboratory

NABL Accredited Laboratory as per ISO/IEC 17025-2005

Managing Director - P. Munikrishnappa, B.E., (Civil) M.I.E. K.E.S.

ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/001 Date:21.02.2018

RBI- Technical Services

AGGREGATE IMPACT VALUE

(IS : 2386 Part - 4)

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of Work	**Improvements to roads in Angala parameshwari temple road from Bhadrappa main road up to Shubham Apartments in ward no 8, Kodigehalli.**
Source of Sample	**Hot Mix Plant**
Date of Testing	20.02.2018
Material	**Wet Mix Macadam**

RBI-TECHNICAL SERVICES Quality Certified Bangalore.

Description		Trails 1	2	3
Wt.Of stone pieces(dry) passing IS Sieve 12.5mm but retained in IS Sieve 10mm(gm)	(Wa)	322.0	322.0	322.0
Wt.Of the fraction retained in IS Sieve 2.36mm after the impact test(gm)	(Wb)	262.9	263.0	263.1
Wt.Of the fraction Passed in IS Sieve 2.36mm after the impact test(gm)	(Wc)	58.40	58.50	58.70
Aggregate Impact value (%)	(Wc/Wa)100	18.1	18.2	18.2
Average Aggregate Impact value (%)			18.2	
Specified Aggregate Impact value (%)			30.0	

RBI -Technical Services (CONSULTANT)

Assistant Engineer

Assistant Executive Engineer

RBI-TECHNICAL SERVICES

Proprietor

G.N. Ramesh

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd State, Bengaluru - 560 104. Tel. : 080 - 23300857

Cell : 9448352709 Email : rbitc2@gmail.com

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/001

Date:21.02.2018

Aggregate Shape Test
IS: 2386 Part I

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of the Work	Improvements to roads in Angala parameshwari temple road from Bhadrappa main road up to Shubham Apartments in ward no 8, Kodigehalli.
Type of Mix	**WMM**
Source of Sample	Hot Mix Plant
Date of Testing	**20.02.2018**

Size of Aggregates		Weight of Fraction consisting of atleast 200 pieces, g		Thickness guage size, mm	Weight of aggregate in each fraction passing thickness guage, g		Length guage size, mm	Weight of aggregate in each fraction retained on length guage, g	
Passing through IS sieve, mm	Retained on IS sieve, mm								
63	50	W_1	0	23.9	w_1	0	--	x_1	0
50	40	W_2	0	27	w_2	0	81	x_2	0
40	25	W_3	0	19.5	w_3	0	58	x_3	0
31.5	25	W_4	0	16.95	w_4	0	--	x_4	0
25	20	W_5	2505	13.5	w_5	155	40.5	x_5	155
20	16	W_6	1950	10.8	w_6	140	32.4	x_6	125
16	12.5	W_7	985	8.55	w_7	120	25.5	x_7	115
12.5	10	W_8	695	6.75	w_8	105	20.2	x_8	90
10	6.3	W_9	125	4.89	w_9	5	14.7	x_9	15

Flakiness Index 8.39%

Elongation Index 7.99%

Combined Flakiness & Elongation Index 16.37%

Comments:

→ Maximum allowable Combined Flakiness and Elongation Index for Bituminous Concrete is 30%

RBI -Technical Services
(CONSULTANT)

RBI-TECHNICAL SERVICES

Proprietor

Assistant Engineer

G.N. Ramesh

Assistant Executive Engineer
Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

RBI-TECHNICAL SERVICES Quality Certified Bangalore

RBI - Technical Services

Reg. No. 290202107599 [MICRO/SERVICES]

Road - Building - Irrigation Material Testing Laboratory

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Managing Director - P. Munikrishnappa, B.E., (Civil) M.I.E. K.E.S.

ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/003 Date:21.02.2018

RBI- Technical Services

GRADATION FOR WMM

MORTH TABLE-400-11

Name of the Work	Improvements to roads in Angala parameshwari temple road from Bhadrappa main road up to Shubham Apartments in ward no 8, Kodigehalli.
Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Source of Sample	Hot Mix Plant
Date of Testing	20.02.2018
Material	Wet Mix Macadam

RBI-TECHNICAL SERVICES Quality Certified Bangalore

Oven dry Wt.(gms) 10000

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	450	4.5	4.5	95.50	95-100
22.4	3195	31.95	36.5	63.6	60-80
11.2	1850	18.5	55.0	45.1	40-60
4.75	1525	15.25	70.2	29.8	25-40
2.36	1205	12.05	82.3	17.8	15-30
0.600	750	7.5	89.8	10.3	8-22
0.075	650	6.5	96.3	3.8	0-8

Note: 1) The results indicated above are based on the tests carried out on the samples received in the laboratory.

2)Any Query regarding the report must be reported immediately.

RBI -Technical Services
(CONSULTANT)

for RBI-TECHNICAL SERVICES

Proprietor

Assistant Engineer

G.N. Ramesh

Assistant Executive Engineer

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd State, Bengaluru - 560 104. Tel. : 080 - 23300857

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RBI - Technical Services

Reg. No. 290202107599 [MICRO/SERVICES]

Road - Building - Irrigation Material Testing Laboratory

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Managing Director - P. Munikrishnappa, B.E., (Civil) M.I.E. K.E.S.

ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/001 Date: 21.02.2018

RBI- Technical Services

ATTERBERG LIMITS TEST FOR WMM
MORTH TABLE-400-13

Client	:	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of Work	:	Improvements to roads in Angala parameshwari temple road from Bhadrappa main road up to Shubham Apartments in ward no 8, Kodigehalli.
Source of Sample	:	Hot Mix Plant
Date of Sample Testing	:	**20.02.2018 to 21.02.2018**
Material	:	**WMM**

RBI TECHNICAL SERVICES Quality Certified Bangalore.

Sl. No.	Name of Test	Test Method	Test Results
1	Liquid Limit	IS : 2720-1985 Part 5 RA : 2010	21.00%
3	Plasticity index	IS : 2720-1985 Part 5 RA : 2010	NP

Remarks:

1 Results relate only to the sample (s) under test in as received condition and applicable parameter (s).

2 The sample will be stored upto one month from the date of issue of test report unless otherwise specified.

RBI -Technical Services
(CONSULTANT)

Assistant Engineer

Assistant Executive Engineer
Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

For RBI-TECHNICAL SERVICES

Proprietor

G.N. Ramesh

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Cell : 9448352709 Email : rbitc2@gmail.com

Quality Control Report For

Bituminous Concrete

RBI - Technical Services

Reg. No. 290202107599 [MICRO/SERVICES]

Road - Building - Irrigation Material Testing Laboratory

NABL Accredited Laboratory as per ISO/IEC 17025-2005

Managing Director - P. Munikrishnappa, B.E., (Civil) M.I.E. K.E.S.

ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/001

Date: 24.02.2018

TEST REPORT

Client	:	Executive Engineer, Byatarayanapura Division, BBMP.
Name of the work	:	Improvements to roads in Angala parameshwari temple road from Bhadrappa main road up to Shubham Apartments in ward no 8, Kodigehalli.
Source of Sample	:	Hot Mix plant
Date of Testing	:	23.02.2018

RBI-TECHNICAL SERVICES Quality Certified Bangalore.

The results of the tests conducted on the **CRMB 55** sample using for Bituminous Concrete collected from the contractor's plant are as follows:

Sl.No	Description	Test Result	Requirement as per IS:15462:2004 for CRMB 55
1	Penetration at 25°c, 1/10 mm,100g.5s	52	< 60
2	Softening point, °c	59	Min. 55
3	Flash Point, °c	245	Min. 220

⇒ *The results indicated above are based on the tests carried out on the samples received in the laboratory.*

⇒ *Any Query regarding the report must be reported immediately.*

For RBI-TECHNICAL SERVICES

Proprietor

RBI -Technical Services

Assistant Engineer

G.N. Ramesh

Assistant Executive Engineer

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

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RBI - Technical Services

Reg. No. 290202107599 [MICRO/SERVICES]

Road - Building - Irrigation Material Testing Laboratory

NABL Accredited Laboratory as per ISO/IEC 17025-2005

Managing Director - P. Munikrishnappa, B.E., (Civil) M.I.E. K.E.S.

ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/001 Date:24.02.2018

RBI- Technical Services

Aggregate Impact Value

IS: 2386 Part IV

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of the Work	Improvements to roads in Angala parameshwari temple road from Bhadrappa main road up to Shubham Apartments in ward no 8, Kodigehalli.
Type of Mix	**Bituminous Concrete**
Source of Sample	Hot Mix Plant
Date of Testing	**23.02.2018**

RBI-TECHNICAL SERVICES Quality Certified Bangalore

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	381	381	
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	84.2	85	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	296.5	296	
4	Aggregate Impact value = percent fines	22.10	22.31	
	100* (W_2/W_1) percent			**22.20**

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

Note: 1) The results indicated above are based on the tests carried out on the samples received in the laboratory.

2)Any Query regarding the report must be reported immediately.

RBI -Technical Services
(CONSULTANT)

Assistant Engineer

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.

RBI-TECHNICAL SERVICES

Proprietor

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd State, Bengaluru - 560 104. Tel. : 080 - 23300857
Cell : 9448352709 Email : rbitc2@gmail.com

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/003

Date:23.02.2018

Aggregate Shape Test

IS: 2386 Part I

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of the Work	Improvements to roads in Angala parameshwari temple road from Bhadrappa main road up to Shubham Apartments in ward no 8, Kodigehalli.
Type of Mix	**Bituminous Concrete**
Source of Sample	Hot Mix Plant
Date of Testing	**22.02.2018**

RBI TECHNICAL SERVICES Quality Certified Bangalore

Size of Aggregates		Weight of Fraction consisting of atleast 200 pieces, g		Thickness guage size, mm	Weight of aggregate in each fraction passing thickness guage, g		Length guage size, mm	Weight of aggregate in each fraction retained on length guage, g	
Passing through IS sieve, mm	Retained on IS sieve, mm								
63	50	W_1	0	23.9	w_1	0	--	x_1	0
50	40	W_2	0	27	w_2	0	81	x_2	0
40	25	W_3	0	19.5	w_3	0	58	x_3	0
31.5	25	W_4	0	16.95	w_4	0	--	x_4	0
25	20	W_5	0	13.5	w_5	0	40.5	x_5	0
20	16	W_6	2150	10.8	w_6	156	32.4	x_6	187
16	12.5	W_7	1550	8.55	w_7	145	25.5	x_7	165
12.5	10	W_8	1000	6.75	w_8	165	20.2	x_8	120
10	6.3	W_9	150	4.89	w_9	20	14.7	x_9	27

Flakiness Index 10.02%

Elongation Index 10.29%

Combined Flakiness & Elongation Index 20.31%

Comments:

→ Maximum allowable Combined Flakiness and Elongation Index for Bituminous Concrete is 30%

RBI -Technical Services
(CONSULTANT)

RBI-TECHNICAL SERVICES

Proprietor

Assistant Engineer

G.N. Ramesh

Assistant Executive Engineer

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.

RBI - Technical Services

Reg. No. 290202107599 [MICRO/SERVICES]

Road - Building - Irrigation Material Testing Laboratory

NABL Accredited Laboratory as per ISO/IEC 17025-2005

Managing Director - P. Munikrishnappa, B.E., (Civil) M.I.E. K.E.S.

ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/001 Date:23.02.2018

RBI- Technical Services

Aggregate Gradation Test

IS : 2386 Part I

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of the Work	Improvements to roads in Angala parameshwari temple road from Bhadrappa main road up to Shubham Apartments in ward no 8, Kodigehalli
Type of Mix	**Bituminous Concrete**
Source of Sample	Hot Mix Plant
Date of Testing	**22.02.2018**

RBI-TECHNICAL SERVICES Quality Certified Bangalore.

Total Weight of Sample: **5000** gms

SIEVE SIZE, mm	Weight Retained, gm	Cummulative Weight retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grading-II specification as per MORTH
13.2	385	7.70	7.70	92.30	79 - 100	
9.5	575	11.50	19.20	80.80	70 - 88	
4.75	815	16.30	35.50	64.50	53 - 71	
2.36	625	12.50	48.00	52.00	42 - 58	
1.18	515	10.30	58.30	41.70	34 - 48	
0.600	345	6.90	65.20	34.80	26 - 38	
0.300	585	11.70	76.90	23.10	18 - 28	
0.150	465	9.30	86.20	13.80	12 - 20	
0.075	385	7.70	93.90	6.10	4 - 10	

Note: 1) The results indicated above are based on the tests carried out on the samples received in the laboratory.
2)Any Query regarding the report must be reported immediately.

RBI -Technical Services
(CONSULTANT)

Assistant Engineer

Assistant Executive Engineer

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

for RBI-TECHNICAL SERVICES

Proprietor

G N. Ramesh

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RBI - Technical Services

Reg. No. 290202107599 [MICRO/SERVICES]

Road - Building - Irrigation Material Testing Laboratory

NABL Accredited Laboratory as per ISO/IEC 17025-2005

Managing Director - P. Munikrishnappa, B.E., (Civil) M.I.E. K.E.S.

ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/003 Date:25.02.2018

RBI- Technical Services

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of the Work	Improvements to roads in Angala parameshwari temple road from Bhadrappa main road up to Shubham Apartments in ward no 8, Kodigehalli.
Type of Mix	**Bituminous Concrete**
Source of Sample	Hot Mix Plant
Date of Testing	**22.02.2018 to 25.02.2018**

RBI-TECHNICAL SERVICES Quality Certified Bangalore

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2440	2450	2450	
2	Weight of basket suspended in water	W_2 g	1220	1220	1220	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1220	1230	1230	
4	Weight of saturated surface dry aggregate in air	W_3 g	2010	2012	2020	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	790	782	790	
6	Weight of oven dried aggregate	W_4 g	2004	2006	2013	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.54	2.57	2.55	2.542
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.556	2.585	2.571	2.564
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.3%	0.30%	0.35%	0.32%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

Note: 1) The results indicated above are based on the tests carried out on the samples received in the laboratory.

2)Any Query regarding the report must be reported immediately.

RBI -Technical Services
(CONSULTANT)
RBI-TECHNICAL SERVICES
Proprietor

Assistant Engineer

G.N. Ramesh

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd State, Bengaluru - 560 104. Tel. : 080 - 23300857

Cell : 9448352709 Email : rbitc2@gmail.com

Quality Control Report For

Bituminous Concrete

RBI - Technical Services

Reg. No. 290202107599 [MICRO/SERVICES]

Road - Building - Irrigation Material Testing Laboratory

NABL Accredited Laboratory as per ISO/IEC 17025-2005

Managing Director - P. Munikrishnappa, B.E., (Civil) M.I.E. K.E.S.

ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/001 Date:28.02.2018

TEST REPORT

Client	:	Executive Engineer, Byatarayanapura Division, BBMP.
Name of the work	:	Improvements to roads in Lottegollahalli from RMV Apartments Phase II up to Railway gate in ward no 8, Kodigehalli.
Source of Sample	:	Hot Mix plant
Date of Testing	:	27.02.2018

TECHNICAL SERVICES Quality Certified Bangalore.

The results of the tests conducted on the **CRMB 55** sample using for Bituminous Concrete collected from the contractor's plant are as follows:

Sl.No	Description	Test Result	Requirement as per IS:15462:2004 for CRMB 55
1	Penetration at 25°c, 1/10 mm,100g.5s	53	< 60
2	Softening point, °c	56	Min. 55
3	Flash Point, °c	230	Min. 220

⇒ *The results indicated above are based on the tests carried out on the samples received in the laboratory.*

⇒ *Any Query regarding the report must be reported immediately.*

For RBI-TECHNICAL SERVICES

Proprietor

RBI -Technical Services

Assistant Engineer

G.N. Ravesh

Assistant Executive Engineer

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

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ISO 9001:2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/2015 Date:28.02.2018

RBI- Technical Services

Aggregate Impact Value

IS: 2386 Part IV

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of the Work	Improvements to roads in Lottegollahalli from RMV Apartments Phase II up to Railway gate in ward no 8,, Kodigehalli.
Type of Mix	**Bituminous Concrete**
Source of Sample	Hot Mix Plant
Date of Testing	**27.02.2018**

RBI-TECHNICAL SERVICES Quality Certified Bangalore.

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	381	381	
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	84	84.8	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	297	296	
4	Aggregate Impact value = percent fines	22.05	22.26	
	100* (W_2/W_1) percent			**22.15**

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

Note: 1) The results indicated above are based on the tests carried out on the samples received in the laboratory.

2)Any Query regarding the report must be reported immediately.

RBI -Technical Services
(CONSULTANT)

RBI-TECHNICAL SERVICES

Proprietor

Assistant Engineer

G.N. Ravish

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd State, Bengaluru - 560 104. Tel. : 080 - 23300857

Cell : 9448352709 Email : rbitc2@gmail.com

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/003 **Date:28.02.2018**

Aggregate Shape Test

IS: 2386 Part I

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of the Work	Improvements to roads in Lottegollahalli from RMV Apartments Phase II up to Railway gate in ward no 8., Kodigehalli.
Type of Mix	**Bituminous Concrete**
Source of Sample	Hot Mix Plant
Date of Testing	**27.02.2018**

Size of Aggregates		Weight of Fraction consisting of atleast 200 pieces, g		Thickness guage size, mm	Weight of aggregate in each fraction passing thickness guage, g		Length guage size, mm	Weight of aggregate in each fraction retained on length guage, g	
Passing through IS sieve, mm	Retained on IS sieve, mm								
63	50	W_1	0	23.9	w_1	0	--	x_1	0
50	40	W_2	0	27	w_2	0	81	x_2	0
40	25	W_3	0	19.5	w_3	0	58	x_3	0
31.5	25	W_4	0	16.95	w_4	0	--	x_4	0
25	20	W_5	0	13.5	w_5	0	40.5	x_5	0
20	16	W_6	2505	10.8	w_6	197	32.4	x_6	187
16	12.5	W_7	1650	8.55	w_7	135	25.5	x_7	157
12.5	10	W_8	1000	6.75	w_8	184	20.2	x_8	100
10	6.3	W_9	200	4.89	w_9	18	14.7	x_9	27

Flakiness Index 9.97%

Elongation Index 8.80%

Combined Flakiness & Elongation Index 18.77%

Comments:

→ Maximum allowable Combined Flakiness and Elongation Index for Bituminous Concrete is 30%

RBI -Technical Services
(CONSULTANT)
RBI-TECHNICAL SERVICES
Proprietor

Assistant Engineer
G.N. Ramesh

Assistant Executive Engineer
Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.

RBI - Technical Services

Reg. No. 290202107599 [MICRO/SERVICES]

Road - Building - Irrigation Material Testing Laboratory

NABL Accredited Laboratory as per ISO/IEC 17025-2005

Managing Director - P. Munikrishnappa, B.E., (Civil) M.I.E. K.E.S.

ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/001 Date:28.02.2018

RBI- Technical Services

Aggregate Gradation Test

IS : 2386 Part I

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of the Work	Improvements to roads in Lottegollahalli from RMV Apartments Phase II up to Railway gate in ward no 8., Kodigehalli.
Type of Mix	**Bituminous Concrete**
Source of Sample	Hot Mix Plant
Date of Testing	**27.02.2018**

RBI-TECHNICAL SERVICES Quality Certified Bangalore

Total Weight of Sample: **5000** gms

SIEVE SIZE, mm	Weight Retained, gm	Cummulative Weight retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grading-II specification as per MORTH
13.2	385	7.70	7.70	92.30	79 - 100	
9.5	575	11.50	19.20	80.80	70 - 88	
4.75	815	16.30	35.50	64.50	53 - 71	
2.36	625	12.50	48.00	52.00	42 - 58	
1.18	535	10.70	58.70	41.30	34 - 48	
0.600	350	7.00	65.70	34.30	26 - 38	
0.300	585	11.70	77.40	22.60	18 - 28	
0.150	465	9.30	86.70	13.30	12 - 20	
0.075	385	7.70	94.40	5.60	4 - 10	

Note: 1) The results indicated above are based on the tests carried out on the samples received in the laboratory.
2)Any Query regarding the report must be reported immediately.

RBI -Technical Services
(CONSULTANT)

For RBI-TECHNICAL SERVICES

Proprietor

Assistant Engineer

G.N. Ramesh

Assistant Executive Engineer

Assistant Executive Engineer
Kodigehalli Sub Division.
Yelahanka Zone, B.B.M.P.
Bangalore.

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd State, Bengaluru - 560 104. Tel. : 080 - 23300857
Cell : 9448352709 Email : rbitc2@gmail.com

RBI - Technical Services

Reg. No. 290202107599 [MICRO/SERVICES]

Road - Building - Irrigation Material Testing Laboratory

NABL Accredited Laboratory as per ISO/IEC 17025-2005

Managing Director - P. Munikrishnappa, B.E., (Civil) M.I.E. K.E.S.

ISO 9001 - 2015 Certified

Job No:RBITS/MT/BBMP-BD/Package-02/2017-18/003 Date:02.03.2018

RBI- Technical Services

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	**Executive Engineer, Byatarayanapura Division, BBMP.**
Name of the Work	Improvements to roads in Lottegollahalli from RMV Apartments Phase II up to Railway gate in ward no 8,, Kodigehalli.
Type of Mix	**Bituminous Concrete**
Source of Sample	Hot Mix Plant
Date of Testing	**27.02.2018 to 02.03.2018**

RBI-TECHNICAL SERVICES Quality Certified Bangalore.

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2440	2450	2420	
2	Weight of basket suspended in water	W_2 g	1220	1220	1220	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_S$ g	1220	1230	1200	
4	Weight of saturated surface dry aggregate in air	W_3 g	2010	2012	2020	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	790	782	820	
6	Weight of oven dried aggregate	W_4 g	2006	2008	2013	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.54	2.57	2.45	2.497
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.552	2.581	2.476	2.514
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.2%	0.20%	0.35%	0.27%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

Note: 1) The results indicated above are based on the tests carried out on the samples received in the laboratory.
2)Any Query regarding the report must be reported immediately.

RBI -Technical Services
(CONSULTANT)

RBI-TECHNICAL SERVICES

Proprietor

Assistant Engineer

G.N. Ramesh

Assistant Executive Engineer
Kodigehalli Sub Division
Yelahanka Zone, B.B.M.P.
Bangalore.

2243, 4th 'A' Cross, Hampinagar, Vijayanagar 2nd State, Bengaluru - 560 104. Tel. : 080 - 23300857
Cell : 9448352709 Email : rbitc2@gmail.com

RBI-Technical Services

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

AASHTO T 164 & AASHTO T 30

CLIENT	**Executive Engineer,** **Byatarayanapura Division, BBMP.**
NAME OF THE WORK	Improvements to roads in Lottegollahalli from RMV Apartments Phase II up to Railway gate in ward no 8, Kodigehalli.
AGENCY	Sri. S.N Ramesh
TYPE OF MIX	**Bitumnious Macadam**
DATE OF TESTING	25/02/18

Vehicle no:

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	484	483.5
3. Difference in weight after extraction (W3) gms= (W1-W2)	16.0	16.50
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	3.20	3.30
5. Average in %	3.25	

RBI-Technical Services
(CONSULTANTS)

Client Representative

G.N. Ramesh
Contractor Representative

For RBI - Technical Services

Site Engineer

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

RBI-Technical Services

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

AASHTO T 164 & AASHTO T 30

CLIENT	**Executive Engineer, Byatarayanapura Division, BBMP.**
NAME OF THE WORK	Improvements to roads in Lottegollahalli from RMV Apartments Phase II up to Railway gate in ward no 8, Kodigehalli.
AGENCY	Sri. S.N Ramesh
TYPE OF MIX	**Bitumnious Macadam**
DATE OF TESTING	25/08/18

Vehicle no:

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	483.50	483.50
3. Difference in weight after extraction (W3) gms= (W1-W2)	16.50	16.50
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	3.30	3.30
5. Average in %	3.30	

RBI-Technical Services
(CONSULTANTS)

Client Representative

G. N. Ramesh
Contractor Representative

For RBI - Technical Services
Deepak. D
Site Engineer

Assistant Executive Engineer
Kodigehalli Sub Division
Yelahanka Zone, BBMP
Bangalore.

RBI-Technical Services

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

AASHTO T 164 & AASHTO T 30

CLIENT	**Executive Engineer,** **Byatarayanapura Division, BBMP.**
NAME OF THE WORK	Improvements to roads in Lottegollahalli from RMV Apartments Phase II up to Railway gate in ward no 8, Kodigehalli.
AGENCY	Sri. S.N Ramesh
TYPE OF MIX	**Bitumnious Concrete**
DATE OF TESTING	02/03/18

Vehicle no:

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	470.5	469
3. Difference in weight after extraction (W3) gms= (W1-W2)	29.50	31.0
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	5.90	6.20
5. Average in %	6.05	

RBI-Technical Services
(CONSULTANTS)

Client Representative

G.N. Ramesh
Contractor Representative

For RBI - Technical Services

Site Engineer

Assistant Executive Engineer
Kodigehalli Sub Division
Yelahanka Zone, B.B.M.P.
Bangalore.

RBI-Technical Services

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

AASHTO T 164 & AASHTO T 30

CLIENT	**Executive Engineer,** **Byatarayanapura Division, BBMP.**
NAME OF THE WORK	Improvements to roads in Lottegollahalli from RMV Apartments Phase II up to Railway gate in ward no 8, Kodigehalli.
AGENCY	Sri. S.N Ramesh
TYPE OF MIX	**Bitumnious Concrete**
DATE OF TESTING	02/03/18

Vehicle no:

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	470.5	470.5
3. Difference in weight after extraction (W3) gms= (W1-W2)	29.5	29.5
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	5.90	5.90
5. Average in %	5.90	

RBI-Technical Services
(CONSULTANTS)

Client Representative

G.N. Ramesh
Contractor Representative

For RBI - Technical Services

Aashath.D
Site Engineer

Assistant Executive Engineer
Kodigehalli Sub Division
Yelahanka Zone, B.B.M.P.
Bangalore.

RBI-Technical Services

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

AASHTO T 164 & AASHTO T 30

CLIENT	**Executive Engineer,** **Byatarayanapura Division, BBMP.**
NAME OF THE WORK	Improvements to roads in Lottegollahalli from RMV Apartments Phase II up to Railway gate in ward no 8, Kodigehalli.
AGENCY	Sri. S.N Ramesh
TYPE OF MIX	**Bitumnious Concrete**
DATE OF TESTING	02/03/18

Vehicle no:

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	469	469
3. Difference in weight after extraction (W3) gms= (W1-W2)	31.0	31.0
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	6.20	6.20
5. Average in %	6.20	

RBI-Technical Services
(CONSULTANTS)

Client Representative

G.N. Ramesh
Contractor Representative

For RBI - Technical Services

Site Engineer

Assistant Executive Engineer
Kodigehalli Sub Division
Yelahanka Zone, B.B.M.P.
Bangalore.

RBI-Technical Services

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

AASHTO T 164 & AASHTO T 30

CLIENT	**Executive Engineer, Byatarayanapura Division, BBMP.**
NAME OF THE WORK	Improvements to roads in Lottegollahalli from RMV Apartments Phase II up to Railway gate in ward no 8, Kodigehalli.
AGENCY	Sri. S.N Ramesh
TYPE OF MIX	**Bitumnious Concrete**
DATE OF TESTING	02/03/18

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2. Weight of Bitumen mix taken after extraction (W2) gms	470.5	469
3. Difference in weight after extraction (W3) gms= (W1-W2)	29.50	31.0
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	5.90	6.20
5. Average in %	6.05	

RBI-Technical Services
(CONSULTANTS)

Client Representative

G.N. Ramesh
Contractor Representative

For RBI - Technical Services

Aashish.D
Site Engineer

Assistant Executive Engineer
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.,
Bangalore.

RBI-Technical Services

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

AASHTO T 164 & AASHTO T 30

CLIENT	**Executive Engineer, Byatarayanapura Division, BBMP.**
NAME OF THE WORK	Improvements to roads in Lottegollahalli from RMV Apartments Phase II up to Railway gate in ward no 8, Kodigehalli.
AGENCY	Sri. S.N Ramesh
TYPE OF MIX	**Bitumnious Concrete**
DATE OF TESTING	02/03/18

Vehicle no:

Description	Trail 1	Trail 2
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3. Difference in weight after extraction (W3) gms= (W1-W2)	29.50	31.0
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	5.90	6.20
5. Average in %	6.05	

RBI-Technical Services
(CONSULTANTS)

Client Representative

S.N. Ramesh
Contractor Representative

For RBI - Technical Services
Aswath.D
Site Engineer

Assistant Executive Engineer,
Kodigehalli Sub Division
Yelahanka Zone, B.B.M.P.
Bangalore.

RBI-Technical Services

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

AASHTO T 164 & AASHTO T 30

CLIENT	**Executive Engineer,** **Byatarayanapura Division, BBMP.**
NAME OF THE WORK	Improvements to roads in Lottegollahalli from RMV Apartments Phase II up to Railway gate in ward no 8, Kodigehalli.
AGENCY	Sri. S.N Ramesh
TYPE OF MIX	**Bitumnious Concrete**
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2. Weight of Bitumen mix taken after extraction (W2) gms	470.5	470.5
3. Difference in weight after extraction (W3) gms= (W1-W2)	29.5	29.5
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	5.90	5.90
5. Average in %	5.90	

RBI-Technical Services
(CONSULTANTS)

Client Representative

G.N. Ramesh
Contractor Representative

For RBI - Technical Services

Aeenash. D
Site Engineer

RBI-Technical Services

BITUMEN CONTENT DETERMINATION OF BITUMINOUS MIX

AASHTO T 164 & AASHTO T 30

CLIENT	**Executive Engineer, Byatarayanapura Division, BBMP.**
NAME OF THE WORK	Improvements to roads in Lottegollahalli from RMV Apartments Phase II up to Railway gate in ward no 8, Kodigehalli.
AGENCY	Sri. S.N Ramesh
TYPE OF MIX	**Bitumnious Concrete**
DATE OF TESTING	02/03/18

Vehicle no:

Description	Trail 1	Trail 2
1. Weight of Bitumen mix taken before extraction (W1) gms	500	500
2. Weight of Bitumen mix taken after extraction (W2) gms	469	469
3. Difference in weight after extraction (W3) gms= (W1-W2)	31.0	31.0
4. Percentage of bitumen in mix = (W3/W1)* 100 (%)	6.20	6.20
5. Average in %	6.20	

RBI-Technical Services
(CONSULTANTS)

Client Representative

G.N. Ramesh
Contractor Representative

For RBI - Technical Services

Site Engineer

Assistant Executive Engineer,
Kodigehalli Sub Division,
Yelahanka Zone, B.B.M.P.
Bangalore.